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Computer Databases: Applications for the Social Studies. ERIC Digest No. 25.

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Computerized databases, one of the more recent applications of computer technology to education, are receiving increased attention from educators because of their potential for helping students develop the very important skills of logical thinking, problem solving, and information handling.

WHAT IS A COMPUTERIZED DATABASE AND HOW DO YOU USE IT?

Databases are files of information which have been organized and indexed for quick and easy access to specific topics. Print databases such as the library card catalog or READER'S GUIDE TO PERIODICAL LITERATURE are familiar to everyone. A computerized database is organized similarly, but with files of information loaded onto software disks or computer tape. With a computerized database, the researcher calls up information by typing in established index terms, numbers, or words.

The advantage of a computerized database over a print file is that the computer can combine, delete, broaden, or narrow categories of data, enabling the user to quickly obtain only the information that meets all his requirements. For example, in a hypothetical "countries of the world" database, one could search for all countries with a Gross National Product (GNP) of over one billion dollars. That search could be further refined to identify only North or South American countries with such a GNP or, further, just those American countries with a certain political system.

Obtaining exactly the information one wants requires a clear definition of the research question and decisions about relevant and extraneous information. Searching a database effectively involves the skills of Boolean logic--the logic of combining and deleting sets of information through the key terms AND, OR, and NOT. Thus, the search outlined above might appear as follows:

Set 1 = GNP \$1 billion Set 2 = North America OR South America Set 3 = republican form of government Set 4 (the desired set) = set 1 AND set 2 AND set 3

WHAT TYPES OF DATABASES ARE AVAILABLE FOR SOCIAL STUDIES?

Two types of computerized databases are currently applicable to the social studies classroom: on-line databases and database software programs.

On-line databases are so named because the personal computer (p.c.) user is linked by phone line to a distant mainframe computer storing documents or information in its memory. On-line databases may contain bibliographic citations, full texts of journal and news articles, or statistics such as stock market prices or weather information.

Among the on-line databases relevant as student research tools in the social studies are THE NEW YORK TIMES INFORMATION SERVICE, AMERICA: HISTORY AND LIFE, HISTORICAL ABSTRACTS, FACTS ON FILE, ERIC, and MAGAZINE INDEX. Even the ENCYCLOPEDIA BRITANNICA is now available as a computerized database.

To access on-line databases, a personal computer must be adapted for telecommunications by using a modem, a communications interface, and communication software. On-line databases are generally available on a subscription basis,

either individually, as with THE NEW YORK TIMES INFORMATION SERVICE, or collectively through a database service. Three widely-known database services are Dialog, BRS, and CompuServe.

All of these services provide access to a wide variety of databases (for example, a Dialog subscription allows access to over 200 separate files) and have low-cost subscription rates for personal computer users. The total expense in using an on-line database includes the flat subscription rate, plus charges for telephone service time, amount of time hooked into the mainframe computer, and a slight reproduction fee for citations ordered. Prices range from \$30.00/hour for ERIC to about \$100.00/hour for THE NEW YORK TIMES.

Database software provides a computer program--a structure--for developing a file of information on any topic. Such a program enables the teacher or students to create custom-made databases for classroom use. Among the commercially-available database software programs appropriate for student users are: PFS FILE (Software Publishing Corp., Mountain View, CA), DATABASE JR. (Intellectual Software, Inc., Bridgeport, CT), NOTEBOOK FILER (D.C. Heath, Lexington, MA), FRIENDLY FILER (Grolier Publishing, New York, NY), and BANK STREET FILER (Broderbund Software, San Rafael, CA). A number of programs are also available as part of integrated packages such as APPLEWORKS.

To design a database using these software programs, students or teachers identify a topic and then define and label specific categories of information (called fields) to be included in the file. To develop a database on "countries of the world," a class would identify the countries to include, then choose fields of information such as population, ethnic groups, language, type of government, or major industries. The final step in database construction is to collect information from available sources and enter it into the software program.

In the past year, a number of textbook publishers have introduced "file package" software for use with database program software. For these packages, the publisher has established fields on specific topics, compiled the data, and entered it onto a separate disk. Together, this file software and the program software form a complete database package on a topic. Database packages developed by commercial publishers for the social studies market include:

--Scholastic's UNITED STATES HISTORY. This package contains three files, "Expanding the Frontier," "Inventions and Technology," and "Twentieth Century America." It is designed for use with PFS:FILE.

--D.C. Heath's fourth-grade social studies file. This package, to accompany NOTEBOOK FILER, contains six files: "Northeast U.S.A.," "My Geography," "United States," "Land and Water," "Natural Resources," and "Timeline." Other files are available for grade 10th-12th social studies.

--Broderbund Software, Inc. is currently developing social studies files to be used with the BANK STREET FILER database program.

WHAT ROLE CAN DATABASES PLAY IN MEETING THE GOALS AND OBJECTIVES OF THE SOCIAL STUDIES?

Software databases can be developed for any social studies content area, from a local community file to U.S. presidential election statistics. On-line databases of journal and newspaper articles currently exist in the fields of U.S. history, world history, Middle Eastern affairs, religion, sociology, and current events.

Databases provide a unique tool for integrating the teaching of social studies knowledge, information skills, and higher order thinking skills. Creating and using databases develops research and organization skills. By searching databases, students learn to identify information needs, make problem statements, retrieve and sort information, and design strategies for organizing data (Lengel and others 1985). Extension activities enhance critical thinking skills.

Through teacher-initiated activities and projects, students can go beyond the level of data input and recall toward evaluating what they find: forming and testing hypotheses, recognizing trends in information, making inferences about data, and solving problems ("Butcher Paper, Data Bases, and Higher Order Thinking Skills" 1985).

The national report, EDUCATING AMERICANS FOR THE 21ST CENTURY, stresses that problem solving, information handling, and communication skills (all skills involved in database applications) will be among the basic competencies of the next century (National Science Board on PreCollege Education in Mathematics, Science, and

Technology 1983). While these skills have always been seen as traditional social studies skills, Hunter (1985) goes a step further, tying these skills specifically to computer literacy.

According to Hunter, as our society moves into the Information Age, in which activities and institutions are based on the organization, storage, and dissemination of information, the ability to sort through information provided by computer and apply that information to problem solving must become a fundamental part of learning. Already political scientists predict that the use of information systems in the political decision-making process will make computer literacy and "informatics" essential to intelligent political participation (Glenn and Klassen 1983).

Indications such as these, that database development and manipulation are fast becoming essential skills of effective citizenship participation, provide perhaps the most compelling rationale for incorporating this tool into social studies instruction.

FOR MORE INFORMATION

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